Cloud Computing in the Federal Government

Presentation to the Customer Advisory Board
San Diego Conference

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- **OMB's Cloud-First Policy**
  - Agencies must move 1 IT system from a legacy environment to a cloud computing environment within the next 12 months
  - Agencies must move an additional 2 IT systems from a legacy environment to a cloud computing environment within the next 18 months

- **25-Point Plan to Reform Federal IT**
  - First five points directly address cloud computing in the federal government

- **Federal Cloud Computing Strategy**
  - Defines the government's approach to cloud transition and implementation

- **Federal Data Center Consolidation Initiative**
  - Under the direction of OMB, the federal government will consolidate 800 data centers by 2015
  - Infrastructure as a Service (IaaS) and Platform as a Service (PaaS), cloud delivery models, can help agencies replace and expand the capabilities of legacy data centers

- **<u>Faster</u> –** Decrease time-to-market to deploy or implement IT solutions
- **<u>Better</u> –** Allows key resources to focus on mission – critical activities and/or use solutions and services on-demand or as-needed
- **<u>Greener</u>** – Save energy and the environment with shared, as-required services
- **<u>Cheaper</u>** – Save money and help to lower the cost of government operations while driving innovation across government by not duplicating infrastructures within and across agencies by using "pay-as-you-go" service models, ability to leverage open-source development communities to decrease cost of licensing
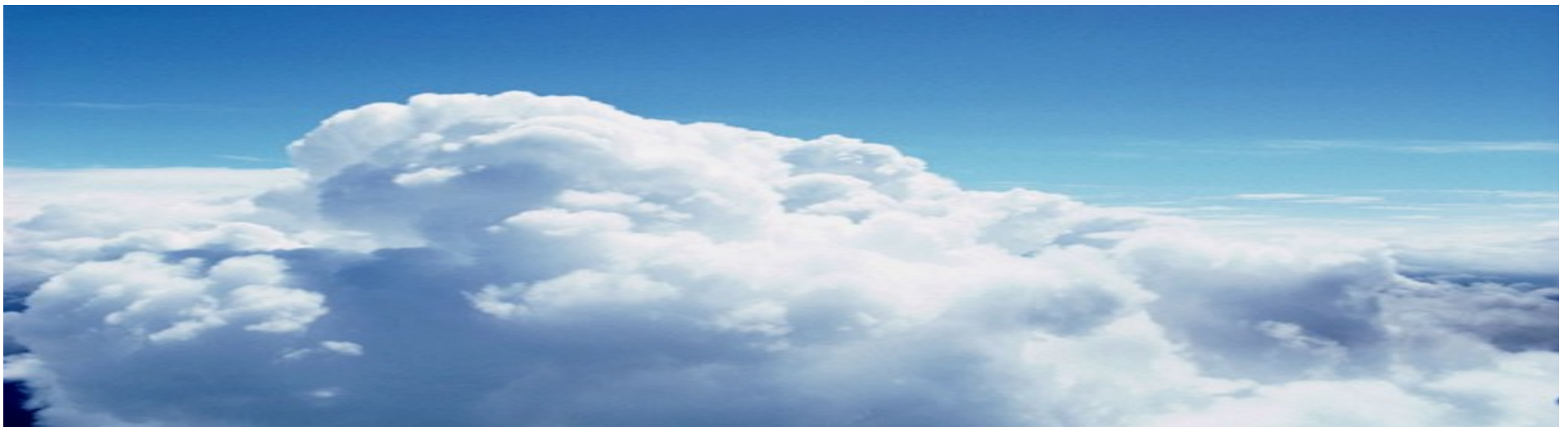
A number of myths abound in the marketplace around cloud financials and cost savings due to a lack of clarity on definition, misinformation and unfounded concerns

"Only Public Clouds provide the savings needed to justify a move"
- Large organizations can realize significant cost savings in a private cloud

"Moving to the cloud means that I won't have to spend on IT support, someone else will be taking care of it."
- There are costs to configuring, deploying, integrating, and managing cloud-based applications.

"The Cloud Is Always Less Expensive"
- Take into account the costs of power, cooling, administration, staffing, and data center real estate for deploying the same application in-house

"Low Cost Is the Cloud's Chief Attraction"
- Agility, scalability, time-to-market, and fast access to high-quality infrastructure often present more compelling benefits than cost savings

- **Funding Allocation** – One of the biggest problems facing cloud adoption is how funding is allocated throughout the enterprise, by leveraging arguments for cost reduction, strategic sourcing, and sustainability, some of this purchasing can be aggregated

- **Working Capital Fund** – Leveraging commoditized services as a way of funding your Working Capital Fund and decreasing reliance on appropriations and improving the fidelity of IT chargeback

- **Hidden Costs of Solutions** – Cloud Computing solutions offer a lot of promise, but as with anything, there are those willing to sell you on it without sharing all of the implications

- **Proliferation of Clouds and Persistence of Silos** – Cloud Computing is a great set of technologies but implemented without consideration to redundancy and we're just creating another set of silos

- **Business Case** – Strengthening the business case template or, at the very least, its review will require additional resources

Hidden Costs

- Bandwidth and Network Management
- Cost of educating/training staff
- Cost of developing and implementing new policy
- Developing and enforcing stronger contract language, e.g. SLAs
- Cultural Resistance – can slow implementations to a crawl and kill any benefit you're seeking

Other Issues

- Latency
- Delivery Models (IaaS, PaaS, SaaS)
- Open Source or Proprietary solutions?
- Service Level Agreements
- Security
- Data Location and Sovereignty

Public vs. Private Clouds

PUBLIC vs. **PRIVATE**

	PUBLIC	PRIVATE
Tenants	• Multiple Tenants – Shared Infrastructure	• Single or Multiple Tenants
Cost	• Commodity Pricing, very transparent and easily understood • SLAs and Security drive up public cloud expense depending upon requirements	• Danger of "one-off" pricing, customized requirements, proliferation of private clouds mimicking organizational boundaries
Location	• Little to no control over location of infrastructure	• Control over location of infrastructure
Security/ Management	• Virtual separation of virtual machines, data, etc. • Less control over monitoring, forensics and response	• Direct control of machines and data • Greater control over monitoring, forensics and response
Data Sensitivity	• Appropriate for existing public-facing data • Low sensitivity data • Other data on a case-by-case basis	• Appropriate for high and low sensitivity data
Scalability	• Scalable within minutes to meet demand	• Scalable to a defined limit
Provisioning	• Self-service	• More complicated but primarily depends upon provider

Stakeholder Perspectives

Perspective	Cloud Computing Value Proposition	Concerns
Agency Leadership	• Ability to redirect resources to mission objectives • Faster delivery • Ability to leverage solutions enterprise-wide • Improved ability to work anytime/anywhere/any device • Adoption of sustainable solutions • Compliance with Federal directives	• "True" cost of migration, Total cost of ownership considerations • Workforce readiness and alignment • Ability to "sell" shared services to other agencies • Organizational and change management
Information Technology	• Ability to meet budget reduction targets • Ability to execute security controls more effectively and consistently • Ability to reduce infrastructure footprint and achieve savings in facilities, personnel, energy, etc.	• Less Control over Infrastructure and Resources • Workforce readiness and alignment • Hidden impacts on other IT areas, such as network bandwidth/design, etc. • Portability and Interoperability
Finance	• Ability to meet cost containment goals & budget reduction • Potential "pay-per-use" cost model, no need to buy dedicated infrastructure for the long-term • Transition of CapEx to OpEx spending • Ability to field services for the enterprise that have improved cost recovery /chargeback models	• Alignment of funding sources ("color of money" issues) • Potential inability to properly evaluate business cases due to lack of understanding of cloud cost structure • Implications for working capital funds
Acquisition	• Ability to aggregate sourcing, achieve cost efficiencies • Leverage buying power • Achieve Strategic Sourcing objectives	• Rampant acquisition of cloud and quasi-cloud solutions • Vastly increased responsibility to architect appropriate SLAs
Security	• Ability to apply security controls across a consolidated environment • Rapid ability to apply patches/fixes	• Encryption (at rest and in transit) • Forensics • Exposure of data to unauthorized parties
User Community	• Faster implementation of solutions • Greater control over configurability of solutions/less reliance on IT	• Performance • Loss of functionality • Records Management/eDiscovery

Cloud Services today more than ever constitute a critical source of IT cost reduction and enhanced functionality for the Federal Government

Cloud Offers Significant Opportunities

- Reduce IT Infrastructure Cost - Significant cost savings by eliminating up front capital investments and moving operational complexity to the cloud

- Increase flexibility - on-demand, capabilities and enablement

- Dynamic scalability - through elastic computing and storage services commonly available

- Rich business tools - Unlocking tools and capabilities offered within the industry that significantly increase time to market and rich functionality

- Tap extensive market developer environment- Ability to open and expose Government Data and Applications to enable a 3rd Party open-source development community

Cloud Enabling Capabilities

- Iaas - On-demand, highly scalable Infrastructure as a Service (IaaS) for Computing, Storage and Hosting Services

- PaaS - Optimized IT and developer tools offered through Platform as a Service (PaaS) for Database and Testing Environments

- SaaS – Offer functionally rich suite of Cloud based applications, such as Salesforce, to quickly enable business processes with minimal IT resources

- Open Source Development – Implement a Fed Cloud SDK to establish open standards based collaboration and development capabilities (Software Development Kit) to expose Government data and applications, enabling 3rd parties to create customized applications for Government or Private sector use

Adoption Challenges

The Federal Government faces some significant challenges on both the Supply Side (vendor solutions) and the Demand Side (Agencies' adoption) for broad scale cloud computing adoption

SUPPLY   **DEMAND**
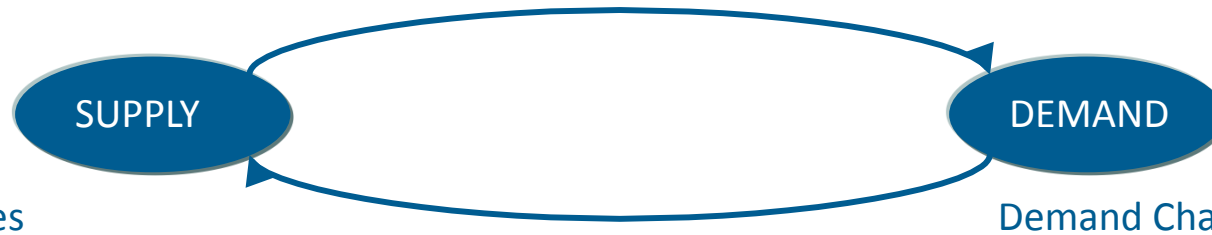
Supply Challenges

- Limited portfolio. Outside of the Social Networking , CRM and email areas there is a limited number of relevant SaaS Cloud solutions targeting Government applications.

- Lack of Integration. Existing Cloud applications do not integrate well, if at all, with current Government applications or across Cloud vendor solutions.

- Security and data privacy controls. Many of the Cloud providers are willing to support the higher security requirements for the Government but the industry as a whole is not there yet.

- Limited Interoperability: Ability to interoperate or make Government data portable

Demand Challenges

- Unfamiliar concept and no clear vision. Most Government Agencies are not familiar with Cloud applications beyond simple Wikis and Blogs and no consistent vision of Cloud has been widely accepted.

- Security and data privacy risks. Agencies who are familiar with Cloud Computing have found very few applications that would meet the security & privacy requirements.

- Contracting barriers. Agencies find that contracting with Cloud vendors directly are not currently supported through the standard vehicles

- Lack of standards with existing apps: Many Agency enterprise applications are non-standards based and will require significant re-engineering to move to a truly take advantage of Cloud capabilities

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Treasury's Move to the Cloud Improves Vulnerability Assessments and Cuts Costs

The Challenge

The Department of the Treasury's Vulnerability Assessment System needed improved security and reliability.

The Solution

Move to a cloud-based scanning system with greater capacity and quality, reduced operating cost, and increased security capability.

Projected Results

- **458% increase in scanning**
- **86% reduction in cost per scan**
- **12% increase in vulnerability detection**
- **Production operation and deployment in 1 day.**
- **Freed 2 FTEs of Engineers**
- **Improved reporting capabilities**
- **Improved resolution time for vulnerabilities**

For more Federal agency case studies, simply go to http://info.apps.gov/content/federal-cloud-computing-case-studies

- **<u>Federal Cloud Computing Information Portal</u> – http://info.apps.gov**
  - **Case Studies**
  - **Federal Cloud Computing Blog**
  - **Recent Federal Cloud Computing News**
  - **Conference Calendar**

- **Online Cloud Computing Storefront – http://apps.gov**
  - **Find out what types of cloud-based solutions are available**
  - **Purchase products**

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